to adherence with ACE inhibitors, beta-blockers and ARBs. **RESULTS:** RAMQ data were obtained for a total of 82,018 patients with a diagnosis of CHF. Among these patients, 59.9% used an ACE inhibitor, 59.5% a beta-blocker, 28.4% an ARB. and 12,344 (15.1%) had used spironolactone. Incidence of hyperkalemia (3.3% vs. 1.4%) and of gynecomastia (1.8% vs. 0.7%) was significantly higher among spironolactone users compared to non users ($p < 0.001$). Treatment compliance was significantly lower with spironolactone compared to ACE inhibitors, beta-blockers and ARBs (45.6% vs. 56.1%, 59.7%, 57.0% respectively; $p < 0.001$). Persistence to treatment over a one year period was also lower with spironolactone compared to ACE inhibitors, beta-blockers and ARBs (50.7% vs. 64.5%, 70.4%, 66.3% respectively; $p < 0.001$) **CONCLUSIONS:** Although the use of spironolactone may be beneficial for patients with CHF, its usefulness is limited by the incidence of adverse events and its relatively poor treatment compliance.

PCV4

SIGNAL DETECTION OF BRADYCARDIA ASSOCIATED WITH ATENOLOL HYDROCHLORIDE

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OBJECTIVES: To compute the frequency of the bradycardia associated with Atenolol Hydrochloride for possible toxic signal detection (SD) by extracting the data from the Canadian Adverse Drug Reaction Monitoring Program (CADRMP) 'MedEffec'. **METHODS:** Appropriate statistical methods such as, Proportional Reporting Ratio (PRR); Reporting Odds Ratio (ROR); the Chi-Square (χ^2) statistic; Observed to Expected Ratio (O/E) and the Du Mouchel method were used for Adverse Drug Reaction (ADR) signal detection. Significance of χ^2 and other calculated statistics, e.g., PRR and ROR was based on a composite criterion of regulatory guidelines e.g. value ≥4.0 for χ^2, and ≥3.0 for the rest to be considered as signal detection. **RESULTS:** The bradycardia associated with Atenolol Hydrochloride was 8 (A) and bradycardia associated with all other antihypertensive medicines was 48 (C). All other adverse drug reactions (except bradycardia) caused by Atenolol Hydrochloride were 235 (B) and all other ADR (but not bradycardia) associated with all other antihypertensive medicines (except Atenolol Hydrochloride) were 2593 (D). The value of PRR was 1.8134; Reporting Odds Ratio was 1.8390 and the $\chi 2$ statistic value was 2.2915. The O/E ratio was 1.7047 and 1.6972 was the value of PRR calculated by the Du Mouchel method. **CONCLUSIONS:** Atenolol hydrochloride, a selective β1 receptor antagonist introduced in 1976 as a replacement for propranolol in the treatment of hypertension shows a number of serious and non-serious adverse drug reactions. Signal detection of bradycardia associated with Atenolol Hydrochloride was not found significant by any of the statistical method. However, since the calculated statistics were considerable, albeit not significant, the possibility of bradycardia-Atenolol Hydrochloride pairing should still be analyzed from larger databases.

PCV5

PERIODONTAL DISEASE, STATIN USE, AND CARDIOVASCULAR EVENTS

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OBJECTIVES: To utilize an integrated medical-drug-dental claims database to understand the relationship between periodontal disease, statin use, and cardiovascular disease (CAD) events. **METHODS:** Patients were selected from the 2005–2007 MarketScan® Dental Database who had periodontal disease, based on diagnosis or dental procedure codes, and 12 months of continuous enrollment prior to the periodontal disease diagnosis (index date). The Dental Database includes medical, pharmacy, and dental records for 6.5 million patients. Patients were divided into two cohorts—treated and not treated with statins—and followed for 12 months for evidence of CAD events. CAD patients were identified using ICD-9-CM diagnosis codes 414.00–414.07 and 414.8–9. **RESULTS:** There were 157,915 patients identified having periodontal disease and meeting the enrollment criteria; 155,802 (98.7%) did not have a CAD event in the 12 months prior to the index date. Twenty-five percent (40,049) of patients with periodontal disease were on statins during this period. Post-periodontal diagnosis, the rate of CAD event was 0.42 percent (N = 652) for statin-treated patients. The rate of CAD event post-periodontal diagnosis date was 1.16 percent (N = 1808) for untreated patients. Controlling for differences in demographics and preexisting clinical conditions, patients not treated with statins prior to being diagnosed with periodontal disease are 2.77 times more likely to have a CAD event in the following 12 months than treated patients. **CONCLUSIONS:** Integrating dental claims with medical and drug claims provides an opportunity to follow a large cohort of patients and determine the relationships between oral and medical care and drug utilization. Statin treatment for an at-risk population with periodontal disease may mitigate the risk of a CAD event. A longer follow-up period will further elucidate this relationship.

PCV6

DEYO-CHARLSON COMORBIDITY INDEX SCORE AND SUBSEQUENT CARDIOVASCULAR DISEASE EVENT RISK AMONG PRIMARY AND SECONDARY RISK DYSLIPIDEMIA MANAGED CARE PATIENTS IN THE UNITED STATES

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OBJECTIVES: Assess associations between the Deyo-Charlson comorbidity index (DCI) score and cardiovascular disease (CVD) event risk among primary (PR) and secondary risk (SR) dyslipidemia patients in a managed care setting. **METHODS:** A retrospective analysis of patients aged ≥18 years with laboratory results from a complete first lipid panel (index date) between January 1, 2002-February 28, 2005 was performed using an integrated managed care research database. Inclusion criteria were patients with minimum of 12 months pre- and post-index date follow-up, without lipid-modifying medication use at least 6 months prior to index date, and at least one of LDL-C, HDL-C, or TG at sub-optimal level per multiple national treatment guidelines. Associations between pre-index DCI score and 3-year CVD event risk was estimated between PR and SR patients using a multivariate logistic regression model after controlling for demographic and clinical variables. **RESULTS:** A total of 45,716 patients were identified, 57.8% (n = 26,407) were PR. Statistical significance was observed between the 2 groups at baseline in terms of percent males (SR: 56.7% vs. 48.3%: PR; $p < 0.0001$), DCI score (SR: 0.16 ± 0.43 vs. PR: 0.64 ± 0.72; $p < 0.0001$), LDL-C (SR: 129.4 ± 35.1 vs. PR: 126.7 ± 34.8 mg/dL; $p < 0.0001$), HDL-C (SR: 42.0 ± 11.2 vs. PR: 48.4 ± 14.0 mg/dL; $p < 0.0001$), and TG (SR: 179.1 ± 79.3 vs. PR: 161.1 ± 79.1 mg/dL; $p < 0.0001$). Regression analysis showed that every one unit increase in pre-index DCI score was associated with a 34% [Odds Ratio (OR): 1.34 (1.27–1.41); $p < 0.05$] higher likelihood to experience a CVD event at 3 years among SR patients versus 32% [OR: 1.32 (1.20–1.46); $p < 0.05$] for PR patients. **CONCLUSIONS:** SR dyslipidemia patients with a higher DCI score were associated with a higher CVD event risk versus PR patients. Further research on this association and subsequent impact on long-term clinical and economic outcomes is needed.

PCV7

ASSOCIATION BETWEEN DEYO-CHARLSON COMORBIDITY INDEX SCORE AND SUBSEQUENT CARDIOVASCULAR DISEASE EVENTS AND ASSOCIATED COST IN DYSLIPIDEMIA MANAGEMENT AMONG MANAGED CARE PATIENTS IN THE UNITED STATES

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OBJECTIVES: Assess associations between the Deyo-Charlson index (DCI) score and annual cardiovascular disease (CVD) event risk and attributable total health care costs (THC) between patients initiating niacin extended-release (NER) plus simvastatin (NER/S) and simvastatin plus ezetimibe (S/E) fixed-dose therapy among patients with prior CVD. **METHODS:** A retrospective analysis of patients aged ≥18 years newly initiating S/E or NER/S therapy (initial therapy of NER added to existing simvastatin therapy) between January 1, 2001-June 30, 2006 (index date) was performed using a large integrated managed care research database. Patients with a minimum of 12 months pre- and post-index date follow-up and a diagnosis of CVD at some time during 12 months prior to index date were included. Associations between pre-index date DCI score, CVD event risk, and THC [sum of inpatient, emergency room, and outpatient visit costs] were estimated using Cox proportional hazards regression model and multivariate generalized linear model, respectively. **RESULTS:** A total of 7065 study patients were identified initiating S/E (n = 6513) or NER/S (n = 552). NER/S patients were significantly younger (58.5 ± 9.2 years vs. 61.3 ± 10.2 years; $p < 0.0001$) and more likely to be male (85.1% vs. 67.9%; $p < 0.0001$). Pre-index date DCI score (1.3 ± 1.3 vs. 1.4 ± 1.6; $p = 0.1018$) was comparable between the two groups. Cox regression showed that every one unit increase in pre-index date DCI score was associated with a 27% [Hazard Ratio (HR): 1.27 (1.22–1.32); $p < 0.05$] higher likelihood to experience a post-index CVD event. Multivariate regression showed that every one unit increase in pre-index date DCI score was associated with a 38% (Coefficient: 1.38, 95% CI: 1.30–1.47; $p < 0.0001$) increase in mean annual CVD THC. **CONCLUSIONS:** High-risk patients with prior CVD and with an increasing DCI score were associated with a higher CVD event risk and total annual CVD-attributable THC. Further studies on dyslipidemia treatment strategies on higher risk patients are warranted.

PCV8

PREVALENCE OF PERIPHERAL ARTERIAL DISEASE IN SUBJECTS WITH A MODERATE CVD RISK, WITH NO OVERT VASCULAR DISEASES NOR DIABETES MELLITUS. THE PANDORA SURVEY—BELGIUM RESULTS

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Despite substantial research showing that peripheral arterial disease (PAD) increases the risk for heart attack, stroke, amputation and other vascular-related conditions, PAD is potentially under-diagnosed and under-treated. Once diagnosed, research indicates that PAD merits aggressive management of all cardiovascular disease (CVD) risk factors. **OBJECTIVES:** The primary objective was to assess the prevalence of lower extremity PAD through Ankle-Brachial Index (ABI) measurement in patients at moderate CVD risk, with no overt vascular diseases nor diabetes mellitus. Secondary objectives included the prevalence and treatment of CVD risk factors and patient/physicians' determinants for PAD under-diagnosis. **METHODS:** PANDORA Belgium was part of a non-interventional, cross-sectional, multi-centre study conducted in six European countries. Selection of general practitioners (GPs) was based on ABI measurement training according ACC/AHA guidelines. **RESULTS:** A total of 119 GPs in Belgium recruited 1510 evaluable patients. The mean prevalence of asymptomatic PAD, defined as ABI <= 0.90, was 7%, the lowest prevalence in the 6 countries (mean 18%). Mean LDL-C for asymptomatic PAD patients was 125 mg/dl. Sixty-seven percent of untreated dyslipidemic subjects, diagnosed with asymptomatic PAD, had LDL-C >= 130 mg/dl. 32% of the Belgian patients were treated with statins. Patients

treated with statins tend to present less (44%) asymptomatic PAD than other patients (OR 0.56; 95%CI 0.30–1.05;p = 0.07). Seventy-four percent of patients were aware of their CV risk, and smoking, high cholesterol, overweight and hypertension were identified by patients as the most important factors increasing the risk on CV disease. **CONCLUSIONS:** Asymptomatic PAD in subjects without CVD but at moderate risk was less prevalent in Belgium than in the other European countries, but was still significantly correlated with classical CVD risk factors, especially smoking, hypertension, lipid profile and age. It could be advisable to identify patients with such risk factors through ABI measurement and treat them accordingly as high risk individuals.

PCV9

CARDIOVASCULAR EVENT REDUCTION AFTER TREATMENT WITH SIMVASTATIN PLUS NIACIN EXTENDED-RELEASE COMBINATION THERAPY VERSUS GENERIC SIMVASTATIN THERAPY FROM A MANAGED CARE ORGANIZATION'S PERSPECTIVE IN THE UNITED STATES

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OBJECTIVES: To compare 5-year cardiovascular (CV) event reduction between patients treated with generic simvastatin therapy (ST) and niacin extended-release [NER] + simvastatin (NER/S) combination therapy among primary and secondary risk patients from a managed care organization's perspective. **METHODS:** Two hypothetical managed care formularies, each consisting of 1,000,000 primary and secondary risk patients were modeled over a five year time horizon: a current formulary where all patients were treated with ST and a revised formulary where all the patients were treated with NER/S. Study patients with sub-optimal LDL-C, HDL-C, and/or TG at baseline were sampled from the HealthCore Integrated Research Database between January 1, 2000 and February 28, 2005. Package insert efficacy of lipid medications in each formulary was applied to the study population. Post-treatment lipid values were evaluated according to U.S. lipid guidelines. Incremental reduction in CV events [myocardial infarction (MI), peripheral vascular disease (PVD), and stroke] among NER/S treated patients versus ST patients was estimated. Market share of NER/S over five years was assumed to be 1.5%. **RESULTS:** A total of 529,620 study patients were identified, having a mean age of 54 ± 11 years, 45% female, and Deyo-Chrlson comorbidity score of 0.38 ± 0.62. Patients treated with NER/S therapy demonstrated an incremental reduction of 1,515 CV events (27,218 vs. 28,733) over 5 years as compared to ST. Incremental reduction in stroke events in the same period were found to be 564 (10,144 vs. 10,708), MI events reduced by 631 (11,341 vs. 11,972), while PVD events reduced by 319 (5,733 vs. 6,052). **CONCLUSIONS:** Treatment with NER/S among primary and secondary risk dyslipidemia patients was associated with 5-year reductions in CV events compared to ST treated patients. Further studies assessing the addition of NER to ST or switching ST treated patients to NER/S therapy on clinical and economic outcomes are needed.

PCV10

A MARGINAL STRUCTURAL MODEL TO COMPARE THE EFFECTIVENESS OF INDIVIDUAL ANGIOTENSIN RECEPTOR BLOCKERS IN VETERANS WITH CHRONIC HEART FAILURE

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OBJECTIVES: There is little evidence to compare effectiveness of individual Angiotensin Receptor Blockers (ARBs) in patients with chronic heart failure (CHF). This study compared four ARBs in reducing risk of mortality in everyday clinical practice. **METHODS:** A retrospective analysis was conducted on a national sample of patients diagnosed with CHF from October 1, 1996 to September 30, 2002 identified from VA Electronic Medical Records, with supplemental clinical data obtained from chart review. After excluding patients with exposure to ARBs within the previous six months, four treatment groups were defined based on initial use of candesartan, valsartan, losartan, and irbesartan between the index date (October 1, 2000) and the study end date (September 30, 2002). Time to death was measured concurrently during that period. A marginal structural model (MSM) controlled for sociodemographic factors, comorbidities, co medications, disease severity (left ventricular ejection fraction), and potential time-varying confounding affected by previous treatment (hospitalization). Propensity scores derived from a multinomial logistic regression were used as inverse probability of treatment weights (IPTW) in a generalized estimating equation to estimate causal effects. Results of MSM were compared to estimates obtained from traditional Cox regression models **RESULTS:** Among the 1,536 patients identified on ARB therapy, irbesartan was most frequently used (55.21%), followed by losartan (21.74%), candesartan(15.23%) and valsartan (7.81%). Adjusted hazard ratios from Cox regression found Candesartan to reduce risk of mortality compared with Losartan (HR = 0.60, 95% CI 0.37–0.96). After adjusting for time-varying hospitalization in MSM utilizing IPTW, candesartan was found not significant (OR = 0.79, 95% CI = 0.42–1.50). Irbesartan and valsartan were found to have similar effectiveness compared to losartan in both analyses. **CONCLUSIONS:** Effectiveness of ARBs in reducing mortality did not differ in patients with CHF in everyday clinical practice. Marginal structural models can be used to compare the effectiveness of multiple treatment groups and may improve risk-adjustment.

PCV11

UNDERSTANDING THE IMPACT OF STATIN TITRATION; A MODELLING APPROACH

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OBJECTIVES: Statin therapy has established cardiovascular benefits. Clinical guidelines set target cholesterol levels for populations at different risk levels. Treatment strategies include initial high-dose or conventional-dose statin followed by titration of patients failing to reach target. Empirical data on dose titration are scarce, but this model simulates potential cholesterol reductions for different populations, therapies and titration steps. **METHODS:** Patient-level cholesterol values before statin therapy, obtained from a large UK primary care database, were grouped into four patient groups in 0.5 mmol/L bands from < 1–10+: 1) no CVD or diabetes; 2) CVD, no diabetes; 3) diabetes, no CVD; 4) diabetes and CVD. Dose efficacy studies enabled calculation of percentage reductions in cholesterol from specified therapies in each band, variance, and the corresponding probability of reaching a specified target. For patients failing to reach target, the next higher statin dose was applied to the starting cholesterol value. Mean cholesterol values of those above/below target were calculated and inserted into a lifetime, cardiovascular outcomes, Excel-based model using Framingham risk equations and baseline parameters from statin clinical trials. **RESULTS:** For the 4 population groups, with a mean cholesterol reduction of 30% (SD 10%), proportions reaching a 4 mmol/L target in one step were: 1) 24%; 2) 35%; 3) 40%; and 4) 45%. Patients above target had two further titrations, each higher-dose therapy reducing cholesterol by a further 5%, with proportions increasing to 49%, 63%, 68% and 71% respectively. Based on these proportions and using Framingham risk equations, corresponding 10-year CVD event rates were estimated as 27%, 42%, 29% and 55% for one-step therapy, and 23%, 39%, 26% and 52% following titration. **CONCLUSIONS:** Titration models provide insights about the impact of different therapy strategies on cardiovascular outcomes for different population groups. The addition of cost data enables the cost-effectiveness of competing statin strategies to be estimated.

PCV12

WHAT IS THE IMPACT OF ARBS VERSUS OTHER ANTI-HYPERTENSIVES ON CV-EVENTS IN HYPERTENSIVE PATIENTS?

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OBJECTIVES: To analyze the percentage of patients treated with anti-hypertensive medication in mono or dual therapy that experienced a CV event. **METHODS:** A retrospective study of the Southwestern Ontario database which contains chart-abstracted information from primary health care facilities in Ontario, Canada was performed. Patients with hypertension were identified as those with a recorded Blood Pressure (BP) exceeding 140/90 mmHg, chart entry of a diagnosis of hypertension, or use of anti-hypertensive medication. Patients treated either in mono or dual therapy with angiotensin II receptor blockers (ARBs), ACE Inhibitors (ACEIs) and Calcium Channel Blockers (CCBs) were included. The number of patients who experienced at least one CV event from 2003 to 2008 was recorded. CV events are stroke, myocardial infarction, congestive heart failure, peripheral vascular disease, coronary heart disease, atrial fibrillation or transient cerebral ischemic attack. Due to the well known comparable safety profile of the compounds, a safety analysis was not performed. **RESULTS:** A total of 53,064 patients treated with an ARB, ACEI or CCB in mono or dual therapy were identified. The proportions of treated patients who experienced a CV event were 4.3% on ARBs compared to 7.0% on ACEIs and 11.0% on CCBs. These differences were statistically significant ($p < 0.001$). Within the ARB class, the proportions of treated patients who experienced a CV event were 3.0% on irbesartan compared to 4.6% on losartan, 5.0% on valsartan and 5.0% on candesartan. These differences were statistically significant ($p < 0.02$). **CONCLUSIONS:** In patients treated in mono or dual therapy, those treated with an ARB experienced significantly fewer CV events than those treated with an ACEI or a CCB. Amongst the ARB-treated patients, those treated with irbesartan as part of their therapy experienced significantly less CV events than those treated with another ARB.

PCV13

EFFECTIVENESS OF ATORVASTATIN, PRAVASTATIN AND SIMVASTATIN IN THE REDUCTION OF CARDIOVASCULAR EVENTS: AN INDIRECT COMPARISON META-ANALYSIS

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OBJECTIVES: To compare the effectiveness of the most commonly prescribed statins in Brazil for the prevention of cardiovascular CV events, using indirect comparison meta-analysis. **METHODS:** A systematic review of the literature was conducted. Medline and the Cochrane Controlled Trials Register were searched for clinical trials that compared Pravastatin 40 mg, Simvastatin 40 mg or Atorvastatin 10 mg against control (placebo or usual care), for primary and secondary CV prevention. Full-texts of relevant abstracts were retrieved and evaluated in duplicate and independently. Fixed-effect models were used for direct statin versus control comparisons, and the methodology described by Bucher et al. (1997) was used to derive indirect comparisons between statins. **RESULTS:** Eleven studies comparing Pravastatin 40 mg